



OUII AR 534

2-19

UNCONTROLLED Rev. 2

DOCUMENT

MIRAP OUII AR 534 2-19 HS PLAN  
PROGRAMMIC HEALTH AND SAFETY PLAN REV 2  
5/91

# Monticello Remedial Action Project

## Programmatic Health and Safety Plan

### Revision 2

### May 1991

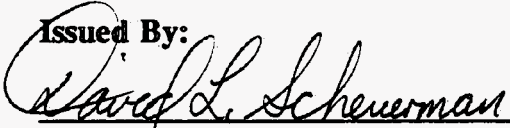
Work performed under  
DOE Contract No.  
DE-AC07-86ID12584 for the  
U.S. Department of Energy

*Grand Junction  
Projects Office*

**SIGNATURE SHEET FOR  
MONTICELLO REMEDIAL ACTION PROJECT  
HEALTH AND SAFETY PLAN**

**VOLUME 1-PROGRAMMATIC HEALTH AND SAFETY PLAN**

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## ACRONYMS and ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienist
AEC	Atomic Energy Commission--currently the Department of Energy
ALARA	As Low As Reasonable Achievable
CERCLA	Comprehensive Environmental Response, Compensation, and Liabilities Act
CFR	Code of Federal Regulations
CI	Construction Inspector--Geotech Construction Management position
CM	Geotech Construction Management Section
FFA	Federal Facilities Agreement
GJPO	Grand Junction Projects Office
HS&S	Geotech Health, Safety, and Security Section
HSP	Health and Safety Plan
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life or Health
Millsite	The Monticello Millsite
MRAP	Monticello Remedial Actions Project
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
MVP(s)	Monticello Vicinity Properties
NFPA	National Fire Protection Agency
NIOSH	National Institute for Occupational Health and Safety
NPL	National Priority List
OMP	Geotech Occupational Medical Program Subsection
ORNL	Oak Ridge National Laboratories
PPE	Personal Protective Equipment
SARA	Superfund Amendments and Reauthorization Act
SCBA	Self-contained Breathing Apparatus
SFMP	Surplus Facilities Management Program
TLD	Thermoluminescent Dosimeter
TLV	Threshold Limit Value--a "Published Exposure Limit"
TWA	Time-weighted Average
UOSHA	Utah Occupational Safety and Health Administration
WBGH	Wet Bulb Globe Thermometer
dBA	Decibels--"A" Scale

## **SECTION 1 - INTRODUCTION**

### **1.1 POLICY**

- a. Chem-Nuclear Geotech (Geotech) strives to provide a safe and healthful work environment for its employees. Geotech considers the prevention of illness and injury in the workplace to have greater importance than any other facet of our work.
- b. Safety will always take precedence over expediency or shortcuts, and every attempt will be made to reduce the possibility of injury, illness, or accident occurrence.

### **1.2 PURPOSE**

- a. Assign Geotech employees health and safety responsibilities.
- b. Define the potential exposure hazards associated with the work to be performed.
- c. Identify prerequisite medical surveillance and training requirements for supervisors, workers and visitors to the Monticello Remedial Action Project (MRAP).
- d. Establish Standard Operating Procedures (SOP) applicable to health and safety, requiring mandatory compliance by all Geotech and subcontractor employees, for use when performing work in the controlled areas.
- e. Prescribe programmatic personal protective equipment requirements for each level of protection.
- f. Establish emergency response procedures.
- g. Provide a mechanism for written addenda to the MRAP Program Health and Safety Plan (HSP) when the scope of the work changes, the need for personal protection changes, or additional procedures require implementation.

**Note:** The Construction Project Manager (PM) will initiate the preparation of any addendum. Prior to implementation, the addendum will require the concurrence of the manager of HS&S and approval by the Program Manager.

### 1.3 PROGRAMMATIC HSPs and Site-specific HSPs

- a. This MRAP Program HSP addresses the programmatic requirements contained in UOSHA R500-108-120, 29 CFR 1910.120, and all additional DOE health and safety requirements. Volume 1 will identify the programmatic requirements to be adhered to throughout the MRAP project. Additional Volumes shall contain "Site-specific HSPs" which will address the individual phases of the MRAP project. These site-specific HSPs will address the following required topics:
1. A safety and health hazard assessment for each major job task and operation.
  2. Specific employee training assignments which will assure compliance with UOSHA and our programmatic requirements.
  3. Personal protective equipment required for the employees at the site by each major task.
  4. Specific medical surveillance requirements which will assure compliance with UOSHA, DOE, and our programmatic requirements.
  5. An air monitoring strategy detailing the frequency and types of air monitoring required to be performed during the accomplishment of the identified tasks.
  6. Specific site control measures to be used including: the establishment of "Controlled Areas" based on the hazards present at the site, the use of the "buddy system", and the specific communications systems to be used.
  7. Decontamination procedures employed for personnel, equipment, and area decontamination.
  8. An emergency response plan addressing standard operating procedures for all foreseen emergency situations.
  9. Confined space entry procedures for identified tasks within confined spaces.
  10. Spill containment procedures for identified tasks that could result in an uncontrolled spill.
- b. When final, the MRAP Programmatic HSP will be the implementing document for MRAP. Site-specific HSPs will be attached to the MRAP Programmatic HSP. The following table identifies a preliminary list of MRAP tasks for which site-specific HSPs will be developed. Site-specific HSPs will be finalized prior to the anticipated

start date of each task, as identified below. If tasks or schedules change, a new list will be provided as an addendum to this document or to the Program, whichever is being utilized.

**Table 1-1**

**Site-specific Health and Safety Plans**

Volume II	Site Maintenance
Volume III	Millsite Characterization
Volume IV	Characterization of BLM Compound
Volume V	Closure of the AEC Wells
Volume VI	Site Preparation @ Millsite
Volume VII	Site Preparation @ Repository
Volume VIII	Excavation and Placement of Tailings
Volume IX	Remediation of Peripheral Properties (except BLM Compound)
Volume X	Remediation of BLM Compound

**1.4 COMPLIANCE**

- a. This HSP complies with all known Utah Occupational Safety and Health Administration (UOSHA) regulations and is based on direction given in 29 CFR 1910.120 (R1910.120).
- b. This HSP complies with Geotech Health and Safety Policies and Procedures.
- c. Several DOE Orders require Geotech to comply with the OSHA and UOSHA regulations. The DOE Orders that apply are outlined below and are located at the Geotech Project Office in Monticello. Of applicable UOSHA and OSHA regulations, the stricter of the two reciprocal regulations will apply.
  1. DOE 5483.1A Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities requires that DOE Contractors at Government-Owned, Contractor-Operated Facilities comply with OSHA 1910 and OSHA 1926 as applied to their work.
  2. DOE 5480.4 Environmental Protection, Safety, and Health Standards clarifies the DOE voluntary compliance policy. All DOE Contractors are required to comply with the Mandatory ES&H Standards (Statutory and Policy

Requirements). Reference ES&H Standards are also provided for more guidance to the Contractors. These regulations cover the protection of employees, the public, and the environment from hazards that may arise because of DOE sponsored activities.

3. DOE 5480.10 Contractor Industrial Hygiene Program requires that contractors have an effective Industrial Hygiene Program based on the Mandatory Standards of DOE 5480.4. The Mandatory Standards listed in Attachment 2 of DOE 5480.4 include OSHA 1910 and OSHA 1926.
- d. This HSP includes other health and safety requirements of the DOE. These other requirements come from the DOE Orders that apply to Geotech work at hazardous waste sites. The DOE Orders that apply include:
  1. DOE 5000.3, "Unusual Occurrence Reporting System."
  2. DOE 5480.1B, "Environmental Safety and Health Program for Department of Energy Operations."
  3. DOE 5480.8, "Contractor Occupational Medical Program."
  4. DOE 5480.9, "Construction Health and Safety Program."
  5. DOE 5480.11, "Radiation Protection for Occupational Workers."
  6. DOE ID 5480.1 Chapter XI, "Radiation Protection for Occupational Workers."

## 1.5 APPLICABILITY

- a. The provisions of the MRAP Programmatic HSP are mandatory for all Geotech personnel, and Geotech-sponsored visitors within the controlled areas of this project. Subcontractors may refer to or incorporate these requirements into their own HSPs.

## 1.6 HISTORY

- a. In late 1940, the Vanadium Corporation of America (VCA) opened a vanadium ore-buying station at Monticello in order to stimulate vanadium mining in the region. Within a short time, ore production increased sufficiently to justify construction of a vanadium mill and, in September 1941, the War Production Board approved the proposal submitted by VCA for mill construction. Funding for construction was provided by the U.S. Government through the Defense Plant Corporation. The Metals Reserve Company assumed operation of the ore-buying station in April 1942,

while the VCA operated the mill. The first vanadium was produced at the new mill on 24 August 1942.

In 1943, VCA began producing a uranium-vanadium sludge for the Manhattan Engineer District (MED), which had recently initiated a program to obtain domestic uranium. The mill was closed in February 1944.

- b. The VCA reopened the mill from 1945 to 1946 under lease from the Defense Plant Corporation and purchased stockpiled ore from the Metals Reserve Company. During this period, the VCA produced a uranium-vanadium sludge which it sold to the Manhattan Engineer District.
- c. The Atomic Energy Commission (AEC) bought the Monticello millsite from the War Assets Administration in 1948. The American Smelting and Refining Company (AS&R) acted as the ore-buying agent for the AEC, and The Galigher Company was engaged to design and operate a uranium mill at the site. In 1956, Lucius Pitkin, Inc., replaced AS&R as the ore-buying agent, and April 1956, the National Lead Company (NLC) assumed operation of the mill. Shortly thereafter, the NLC also took over ore weighing, sampling, and stockpiling activities, while Lucius Pitkin, Inc., continued to conduct administrative activities associated with ore purchase contracts, assaying, and settlements. The mill closed in January 1960, but the ore-buying station remained open until 31 March 1962.

## 1.7 DESCRIPTION OF MILLING PROCESSES

### a. VCA Salt Roast Process

1. During VCA operations at the Monticello mill, a salt roast process was used to convert vanadium mineral to soluble form. However, the high lime content of the carnotite ore processed at the mill presented metallurgic problems.
2. The calcium carbonate caused excessive slagging, and the calcium liberated by roasting formed insoluble vanadium compounds. To counteract these problems, pyrite was added to cause some of the calcium to form calcium sulfate.
3. The hot ore was quenched in a solution of sodium carbonate, at which point most of the vanadium dissolved and calcium remaining as calcium chlorate precipitated as calcium carbonate.
4. After successive washing, the sands were transferred to tailings. Precipitation of vanadium pentoxide ( $V_2O_5$ ) from the pregnant liquor was induced by the



addition of sulfuric acid. The precipitate was washed to remove sodium chloride and sodium sulfate, and the wash water was discharged to the nearby creek.

b. AEC Processes

1. Ores received at the AEC ore-buying station and processed at the mill came from a wide geographic area and had a broad spectrum of metallurgic properties that affected the milling. As many as 27 different ore types were recognized among Colorado Plateau ores, which required a variety of milling processes.
2. Tests on the ores for process amenability were performed by the Monticello plant, at the U.S. Bureau of Mines in Salt Lake City, and by the AEC Pilot Plant in Grand Junction.
3. The milling processes used at Monticello during the 12 years of AEC operation included:
  - a) Up to 1955 - Raw ore carbonate leach, low-temperature roast/hot carbonate leach, salt roast/ hot carbonate leach.
  - b) From 1955 to 1958 - Acid leach resin-in-pulp (RIP), raw ore carbonate leach.
  - c) From 1958 to closure in 1960 - Carbonate pressure leach RIP.

1.8 OPERABLE UNITS

- a. Due to the complexity of the Monticello Mill Tailings Site, DOE has divided the work into three manageable components called "Operable Units". Operable units are used to differentiate the types of properties or kinds of contaminated materials and to provide a means for developing and evaluating alternatives for remedial action for each operable unit.
  1. Operable Unit I - Mill Tailings and Millsite Property
    - a) Operable Unit I includes the 78 acres of the millsite and the tailings impoundment areas, the tailings removed from the peripheral properties, and the tailings removed from Monticello Vicinity Properties. The tailings piles are within the floodplain of Montezuma Creek. They are also partially in contact with a shallow alluvial aquifer underlying the

site. An estimated 100,000 cubic yards of contaminated material have been identified in the mill area; and approximately 1.4 million cubic yards (2 million tons) of tailings, contaminated soil, by-product material, and contaminated building material are located in the tailings impoundment areas.

2. Operable Unit II - Peripheral Properties

- a) Peripheral properties include private land to the north and south of the existing site leased for the stockpiling of ore. The former ore-stockpile areas and areas contaminated by airborne tailings or surface water transported materials cover approximately 300 acres around the site and contain most of the estimated 300,000 cubic yards of peripheral property material to be remediated. Peripheral properties also include the bed and banks of a 3.3-mile reach of Montezuma Creek extending from the millsite to the confluence of Montezuma and Vega Creeks.

3. Operable Unit III - Ground Water and Surface Water

- a) Operable Unit III includes all of the alluvial aquifer beneath the tailings piles extending approximately one mile down stream. At present, the alluvial aquifer is not used as a private or public drinking water source and is separated from the deeper Burro Canyon aquifer by the Dakota Sandstone. The Burro Canyon aquifer, which is currently being used as a drinking water supply, has not been contaminated. The total water volume that is contaminated is estimated to be approximately 163 acre-feet. An acre-foot of water is equivalent to 325,000 gallons.
- b) Operable Unit III surface water consists of Montezuma Creek, which flows through the millsite. It is a small perennial stream with headwaters in the Abajo Mountains immediately west of Monticello.

## **SECTION 2 - ASSIGNMENT OF RESPONSIBILITIES-GEOTECH**

The Department of Energy (DOE) manages the Grand Junction Projects Office (DOE/GJPO) in Grand Junction, Colorado. Chem-Nuclear Geotech is the operating contractor at the GJPO. Geotech's program manager for MRAP reports to a DOE/GJPO program sponsor. Further details of the program manager/project manager structure at Geotech are found in the Operations Management Policy Manual (Manual 104). A copy of the manual will be in the custody of the Site Health and Safety Coordinator (SHSC) in Monticello. The names and telephone numbers of the following Geotech personnel shall be conspicuously posted on the site and shall be reviewed during pre-activity training.

### **2.1 PROGRAM MANAGEMENT**

#### **a. Program Manager, Geotech**

1. Has full authority in any matter involving program cost, schedule, personnel, and performance.
2. Performs agency liaison in all matters at MRAP.
3. Approves and issues the MRAP Programmatic HSP.

### **2.2 CONSTRUCTION MANAGEMENT (CM)**

#### **a. Project Manager, Geotech**

1. Responsible for all Geotech activities associated with MRAP remedial action.
2. Directs the implementation of the MRAP HSP in the field.
3. Prepares and directs the production for addenda to the MRAP Programmatic HSP as necessary, during the progress of the work to adequately address changing conditions and scope.
4. Submits the addenda for concurrence by the Manager-Health, Safety, and Security (MGR-HS&S).

**b. Field Engineer (FE), Geotech**

1. Coordinate on-site project activities.

**c. Construction Inspector (CI)**

1. Act as the direct representative of CM in the field.
2. Provide for site security during normal working hours.

**2.3 HEALTH AND SAFETY**

**a. Manager-Health, Safety, and Security Section (MGR-HS&S), Geotech**

1. Provides technical support for the development of the HSP.
2. Provides technical guidance for development of health and safety procedures to be used at the work site.
3. Reviews and concurs with the HSP submitted by the PM.
4. Agency liaison on matters relating to safety and health at MRAP.

**b. Manager Occupational Medical Program (MGR-OMP)**

1. Responsible for the administration of the Occupational Medical Program.
2. Acts as interface between the Contract Physician, the Emergency Treatment Facility, and Geotech.
3. Maintains all Geotech employee medical and exposure records.
4. Correlates exposure data to ensure scope of annual "at-risk" physical examinations are correct.
5. Issues letters to Geotech employees relating to exposure to hazardous materials.
7. Provides consulting physician with the following:
  - a) Copy of 29 CFR 1910.120.
  - b) Data relating to expected employee exposure levels.
  - c) Description of PPE to be used on work sites.

- d) Description of employee's duties as they relate to the employee's exposure.

**c. Operational Health and Safety (OH&S) Supervisor (OHS-SUP), Geotech**

1. Assigns the responsibility of OHSS. The name of the technician assigned this task will be posted at the site.
2. Provides technical guidance for the OHSS and other Operational Health and Safety Technicians (OHST) assigned to work at MRAP.
3. Performs technical review of health and safety documentation and worker exposure monitoring.
4. Provide technical guidance to the PM-MRAP for the content of any addenda.
5. Reviews and concurs with the HSP submitted by the PM.

**d. Site Health and Safety Coordinator (SHSC), Geotech**

1. Senior OHST on site. Reports to the OHS-MGR. Responsible for the supervision of subordinate OHSTs, when assigned to the site.
2. Ensures implementation of the principles and requirements established in this HSP and site-specific HSPs.
3. Advises the Field Engineer (FE) and Construction Inspector (CI) on all aspects of the site health and safety.
4. Suspends work if any operation creates an imminent danger to workers' health and safety.
5. Assumes responsibilities listed in Section 2.3.e. when no other OHST is assigned to the site.
6. Supports the site-specific training (Section 4.2.b), Hazard Communication training (Section 4.2.d), and weekly "Tailgate" safety training meetings (Section 4.3).
7. Provides and maintains a site copy of 29 CFR 1910.120 and all supporting reference material, including referenced Geotech manuals, and ensures full employee access.

**e. Operational Health and Safety Technician (OHST), Geotech**

1. Performs and documents all required area sampling and worker exposure monitoring as outlined in Section 7.
2. Provides technical guidance to the Construction Inspector for the establishment of:
  - a) Work boundaries.
  - b) Levels of PPE Protection.
  - c) Work/Rest regimes.
3. Performs periodic safety inspections.

## SECTION 3 - MEDICAL SURVEILLANCE PROGRAM

### 3.1 CONSULTING PHYSICIAN

Geotech's company physician is:

G. K. Omura, M.D.  
1120 Wellington Avenue  
Grand Junction, CO 81501  
(303) 241-6011

Dr. Omura has been familiarized with the hazardous materials identified in Section 5 that are suspected as being potential worker exposure hazards during the work at MRAP. The Monticello physician is also familiar with the hazardous substances identified in Section 5.

### 3.2 EMERGENCY TREATMENT FACILITY

- a. The Emergency Treatment Facility designated for use in emergency treatment of injuries or illness is:

San Juan Hospital  
364 West First North  
Monticello, Utah. 84535  
(801) 587-2116

1. The MGR-OMP has familiarized the physicians at this facility with the hazardous substances identified in Section 5 that are suspected as being potential worker exposure hazards during the work at MRAP.
2. This facility will be used in the event that emergency treatment of a worker is required, including contaminated injured persons that are evaluated as requiring immediate life-saving medical attention. If required by San Juan Hospital, the OHST shall be transported along with any medical emergency victims to direct decontamination efforts at the emergency treatment facility. Decontamination of injured persons who are not medical emergencies will be conducted by the SHSC prior to transportation to the treatment facility. These procedures are addressed in detail in Geotech's Manual-103, Health and Safety Manual.

- b. The back-up facility is:

St. Mary's Hospital and Medical Center  
2635 North 7th Street  
Grand Junction, CO 81504  
(303) 244-2273

Transportation would be accomplished via the hospital's Air Life Helicopter.

- c. The OHST shall ensure that the map providing the location of San Juan Hospital, including primary and secondary travel routes from the millsite and repository site, shall be posted in a location conspicuous to all workers at the millsite and repository site. This map is included as Figure 3.2-1.

### **3.3 PHYSICAL EXAMINATION**

a. **Introduction**

1. All Geotech personnel on site who may be exposed to hazardous material will, at no cost to themselves, have successfully completed a preplacement or periodic/update physical examination.
2. Subcontractor personnel will meet the medical requirements of 29 CFR 1910.120.
3. The examination requirements listed in this section have been designed to comply with 29 CFR 1910.120 requirements for hazardous waste site operations.



**b. Initial Examinations**

**1. Geotech employees:**

- a) Completion by the employee of the "Medical and Occupational History Form", (FORM Geotech-1616B).
- b) Complete Blood Count with Differential
- c) SMAC 23
- d) Urinalysis (dipstick and microscopic)
- e) Chest X-ray - if Geotech does not have one on file within the past three years.
- f) Pulmonary Function Test (FEV/FVC)
- g) Audiogram
- h) Electrocardiogram
- i) Visual Acuity

**FIGURE 3.2-1  
HOSPITAL LOCATION  
AND EMERGENCY  
ROUTE MAP**

**CITY OF MONTICELLO**

**LEGEND**

- PROPOSED EMERGENCY ROUTE
- ALTERNATE EMERGENCY ROUTE

**Map Labels:**

- EAST 800 NORTH
- EAST 600 NORTH
- WEST 200 NORTH
- WEST 100 NORTH
- WEST 100 SOUTH
- WEST 200 SOUTH
- WEST 300 SOUTH
- WEST 400 SOUTH
- WEST 500 SOUTH
- WEST CENTER
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2. Subcontractor Employees

- a) All subcontractor employees who have potential for exposure to hazardous substances at or above the P.E.L. should have successfully completed an examination similar to the preplacement physical specified in Section 3.3.b.1.
- b) The cost for medical surveillance will be paid by the subcontractor.

3. The Physician will provide the subcontractor with a "Physicians Opinion" upon completion of the medical examination. The subcontractor will then, in turn, pass this opinion on to the MGR-OMP. The subcontractor physician shall also provide, in writing, the physician's name, address, license number, and state in which he is licensed to practice.

c. Injury/Illness re-examinations

- 1. Any employee of Geotech will be given another physical examination if:
  - a) They are suspected of having an overexposure to the hazardous materials on site.
  - b) They develop a lost-time illness of 5 working days or more.
  - c) They sustain any lost-time injury.
- 2. Geotech employees located in Monticello, Utah, will see the consulting physician discussed in Section 3.1, as directed by Dr. Omura, Geotech's Contract physician.
- 3. Subcontractor employees will be seen by the subcontractor's physician, at the subcontractor's expense. Subcontractors will notify Geotech within 24 hours of any work related injury or illness.
- 4. If an injury/illness is the result of a hazardous material exposure, the SHSC shall promptly notify the Consulting Physician and/or Treating Physician of the material identified as that which caused the exposure.

- a) Material identification may be accomplished through use of:
  - i) Real Time monitoring equipment (photoionization detectors in conjunction with detector tubes).
  - ii) Conventional industrial hygiene monitoring (lapel air sampling, dermal exposure patch, etc.).
  - iii) Any prior sampling results available.
- 5. The scope of the re-examination requirements will be specified by the MGR-OMP and the Consulting Physician.
- 6. The physician will complete a "Physician's Recommendation for Return to Work" (FORM Geotech-1574) after completion of the re-examination of each employee to certify that he/she is fit to return to work, and if necessary, specify any activity restrictions to be followed.
- 7. Specific emergency response procedures to be followed in the event of an injury or illness occurrence on the site are cover in Section 11 of this HSP.
- 8. Requirements for reporting Off-Normal Events are specified in Reference 5, Appendix C.
- d. Termination
  - 1. All personnel must complete a physical examination upon termination.

### 3.4 MEDICAL RECORDS

- a. Personnel medical and exposure monitoring records will be maintained in accordance with the requirements of 29 CFR 1910.120 and will be kept for a minimum of 30 years after termination. Employee confidentiality will be maintained.
- b. Employees will be notified on an annual basis of the following:
  - 1. Status/results of medical examinations.
  - 2. Right to access those records at any time.
  - 3. Where and how to access medical records.

## SECTION 4 - TRAINING PROGRAM

### 4.1 INTRODUCTION

- a. This training program is designed to address the requirements of:
  1. OSHA Hazardous Waste Operations and Emergency Response Standard 29 CFR 1910.120.
  2. OSHA Hazard Communication Standard 29 CFR 1910.120.
  3. All reciprocal UOSHA regulations apply for cited OSHA regulations.
- b. Each employee, supervisor, subcontractor employee and subcontractor supervisor working on the site exposed to hazardous substances, health hazards, or safety hazards will receive training that meets the requirements of this section.
- c. No person required to be trained by Section 4.1.b. will participate in or supervise hazardous waste operations that could expose them to hazardous substances, health hazards, or safety hazards associated with the site prior to documented completion of all training requirements in this section.
- d. The requirements of this document and all addenda will be disseminated to personnel working in areas exposed to hazardous substances on site through formal training sessions. Signature verification shall be required from each employee trained.
- e. Site visitors will be exempt from the provisions of this section but will be required to attend a safety briefing which contains applicable sections of site-specific employee training (see Section 9.4).

### 4.2 PRE-PROJECT TRAINING

- a. **Off-site Training**
  1. All employees and contractors who have potential of exposure to hazardous materials shall have successfully completed a formal training program that will include a minimum of 40 hours of initial off-site instruction as per 29 CFR 1910.120, and a minimum of three days actual field experience under instruction with a trained, experienced supervisor, unless they meet the following criteria:

- a) Workers on site only occasionally for a specific limited task (such as, but not limited to, ground water monitoring, land surveying or geophysical surveying), and who are unlikely to be exposed over permissible exposure limits and published exposure limits, shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained experienced supervisor.
  - b) Workers regularly on site who work in areas which have been monitored and fully characterized as being clean (indicating that exposures are under permissible or published limits, respirators are not necessary, and there are no health hazards or the possibility of an emergency developing) shall receive a minimum of 24 hours of instruction off the site and one day actual field experience under the direct supervision of an experienced supervisor.
  - c) Workers with 24 hours of training who are covered by paragraphs a and b of this section and who become general site workers or who are required to wear respirators shall have the additional 16 hours and two days of training necessary to total the training specified for all employees.
2. Management directly responsible for on-site operations and supervisors directly responsible for employees engaged in hazardous waste site operations shall complete at least 8 additional hours of specialized training on managing such hazardous waste site operations at the time of job assignment.
  3. Workers who are exposed to unique or special hazards shall be provided additional training. The level of training provided shall be consistent with the employee's job function and responsibilities.
  4. The standard Red Cross First Aid and Cardiopulmonary Resuscitation (CPR) training is required for all OHSTs assigned to the site.
  5. All employees will be current in the training listed in numbers 1) through 4) above as applicable by meeting the refresher requirements as per 29 CFR 1910.120.

**b. Site-Specific Training**

1. This training will be facilitated by the SHSC and coordinated by the CI, or a designated alternate. This training will be provided from an approved lesson plan, based on the requirements of this HSP.
2. The content of the training will include but not be limited to:
  - a) Names of personnel and alternates responsible for site health and safety.
  - b) Safety, health, and other hazards present on the site as discussed in Section 5 of this HSP.
  - c) The proper use of PPE as discussed in Section 6 of this HSP.
  - d) The approved SOPs and Emergency Response Actions contained in Sections 8 and 10 of this HSP.
  - e) The safe use of engineering controls and equipment on the site.
  - f) The Medical Surveillance Program contained in Section 3 of this HSP.
  - g) Site access controls, methods of posting of controlled areas.
  - h) Requirements for confined space entries.

**c. Radiation Worker Training**

1. All employees will receive Radiation Worker Training as provided by Geotech Manual-103, Health and Safety Manual, ES&H Procedure 9.2. This procedure meets the requirements of DOE 5480.11 for initial radiation worker qualification. This procedure also meets the requirements for annual radiation worker refresher qualification.

**d. Hazard Communication Training**

1. All employees will receive Hazard Communication Training as provided by Geotech Manual 103, "Health and Safety Manual," ES&H Procedure 8.11. This training will be coordinated by the CI, or a designated alternate, with support from the SHSC.

2. The content of the training will include but not be limited to:
  - a) Requirements of 29 CFR 1910.120 pertaining to employee information and training.
  - b) Operations in the work area where hazardous chemicals and physical agents are present.
  - c) The location and availability of the written hazard communication program and MSDS sheets.
  - d) The methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area.
  - e) The health hazards of the chemicals and physical agents in the work area.
  - f) Measures workers can take to protect themselves.
  - g) Information on the labeling system used to identify hazardous materials by the employer.
  - h) The hearing conservation program.
  - i) The respiratory protection program.
  - j) Labeling of hazardous material containers.

#### **4.3 TAILGATE SAFETY MEETINGS**

- a. Weekly "tailgate" Safety meetings will be conducted for Geotech employees by the CI or a designated alternate and documented on Training Attendance Sheets (Form GJPO 1720).
- b. The discussion at these meetings will include:
  1. The health and safety considerations and necessary protective equipment for the current operations.
  2. Any addenda to this HSP or field changes to the site-specific HSPs.
  3. Any new MSDS filed on site.



4. All documented and/or observed unsafe acts committed on the site since the previous meeting and methods to prevent recurrence.

#### 4.4 TRAINING RECORDS

- a. All training that is conducted by or for Geotech will be documented on Form Geotech-1720 "Training Attendance Sheet".
- b. Successful completion of the Geotech facilitated training specified in Section 4.2 b., c., and d. is required for all employees and subcontractor employees prior to the commencement of work on the site by that employee.
- c. Proof of the training requirements specified in Section 4 will be required prior to an employee being given access to the site.
- d. Retention of all training records for archive will be performed at the GJPO, by training and employee development. Copies will be maintained in the OHS project file.

## SECTION 5 - HEALTH AND SAFETY HAZARD IDENTIFICATION

The following text provides an overview of the hazards that have been identified as potential employee exposure hazards during work at the MRAP sites. The hazards will be addressed in more detail, as they affect specific tasks, within the Site-specific Health and Safety Plans.

### 5.1 POTENTIAL CONTAMINANTS

#### a. Chemical Hazards

Surface contamination of uranium ore has been identified as potential exposure hazards at the MRAP sites. The uranium ore is rich in many other heavy metals. All constituents are listed alphabetically and discussed below.

1. Antimony Permissible Exposure Limit \_ 0.50 mg/M3

Antimony is not provided a "Skin" designation by OSHA, but is considered a primary skin irritant. Lesions may appear on exposed moist areas of the body, but rarely on the face. The dust may also irritate the eyes, nose, and throat and may be associated with gingivitis, anemia, and ulceration of the nasal septum and larynx. Symptoms of exposure include irritated nose, throat, mouth; coughing.

2. Arsenic Permissible Exposure Limit - 0.1 mg/M3

Arsenic is considered carcinogenic to humans by IARC, and is an OSHA regulated carcinogen. Arsenic is a skin irritant and may cause dermatitis. Some arsenic compounds, after prolonged contact, are corrosive to the skin. Acute toxic effects of arsenic from inhalation are exceedingly rare. These effects of arsenic are generally seen following ingestion, however this too rarely occurs in the occupational setting. Symptoms of ingestion are constricting of the throat, stomach pains, vomiting, and diarrhea.

3. Beryllium Permissible Exposure Limit - 0.002 mg/M3

Beryllium is considered probably carcinogenic to humans by IARC. Beryllium is a highly toxic substance. Entrance to the body is almost entirely through inhalation. Effects of exposure primarily involve the respiratory tract, such as a nonproductive cough, substernal pain, moderate shortness of breath, and some

weight loss. Long term exposure to beryllium can cause "Chronic Beryllium Disease" which frequently has a latency period from five to ten years.

4. Cadmium Permissible Exposure Limit - 0.20 mg/M3

Cadmium is considered probably carcinogenic to humans by IARC. Cadmium is a respiratory tract irritant. Prolonged exposure can cause olfactory fatigue and a yellow stain that gradually appears on the necks of the teeth. Acute toxic effects of cadmium are almost always caused from inhalation of dusts or fumes when the cadmium is heated. Symptoms include irritation of the upper respiratory tract, coughing, pain in the chest, and sweating.

5. Chromium Published Exposure Limit - 0.50 mg/M3

Hexavalent chromium is considered carcinogenic to humans by IARC. In some workers chromium acts as an allergen which causes dermatitis to exposed skin. Most cases of toxic effects to exposure to chromium occur in the electroplating industry and during the manufacturing process.

6. Copper Permissible Exposure Limit - 1.00 mg/M3

Copper salts act as a skin irritant causing itching, redness of the skin, and dermatitis.

7. Lead Permissible Exposure Limit - 0.05 mg/M3

Exposure to lead can be from inhalation of dusts or from skin exposure. Symptoms are non-specific, and can be hard to distinguish from minor seasonal illnesses. The symptoms are decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, digestive disorders (particularly constipation), abdominal pains and decreased appetite.

8. Mercury Permissible Exposure Limit - 0.10 mg/M3 ceiling limit

Mercury is a primary irritant of the skin and mucous membranes, and may also be a sensitizer. Symptoms of exposure include weakness, loss of appetite, loss of weight, insomnia, indigestion, coughing, and chest pains.

9. Molybdenum Permissible Exposure Limit - 5.00 mg/M3

Molybdenum exposure can cause irritation of the eyes, and mucous membranes of the nose and throat.

10. Nickel Published Exposure Limit - 0.05 mg/M3

Nickel is considered carcinogenic to humans by IARC. Skin sensitization is the most common form of toxic reaction to nickel. Inhalation of nickel dusts produce an increased incidence of lung and nasal cancer. The latency period of these cancers is about 25 years.

11. Selenium Permissible Exposure Limit - 0.20 mg/M3

The first and most characteristic sign of selenium exposure is a garlic odor of the breath. More subtle and earlier signs of exposure is a metallic taste in the mouth, other symptoms include lassitude, irritability, indigestion, and giddiness.

12. Respirable Silica Permissible Exposure Limit - 0.10 mg/M3

Inhalation of crystalline silica can cause silicosis (a progressive and frequently incapacitating pneumoconiosis) evident on x-ray and pulmonary function exams. Symptoms include coughing, wheezing, shortness of breath, and impaired lung capacity.

13. Silver Permissible Exposure Limit - 0.01 mg/M3

Symptoms of exposure to silver are argyria, or a permanent pigmentation of the skin.

14. Thallium Permissible Exposure Limit - 0.10 mg/M3 - Skin Designation

Thallium is a skin irritant and a sensitizer, but these symptoms rarely occur in the occupational environment. Thallium is extremely toxic and a cumulative poison. Early symptoms of exposure include fatigue, limb pain, metallic taste in the mouth, and loss of hair.

15. Vanadium Permissible Exposure Limit - 0.05 mg/M3

Vanadium compounds, especially vanadium pentoxide, are irritants to the eyes and skin. Symptoms of exposure include watering and burning eyes, a green discoloration of the tongue, and a metallic taste in the mouth.

Inhalation of vanadium pentoxide can cause an irritation of the respiratory tract, serious or hemorrhagic rhinitis, sore throat, cough, bronchitis, expectoration, and chest pain, even after a brief exposure. More serious exposure can result in pulmonary edema and pneumonia which may be fatal.

16. Zinc

Permissible Exposure Limit - 5.00 mg/M3

Under poor hygiene conditions dermal exposure to zinc can cause a specific dermatitis. Toxic effects of inhalation are not experienced outside the manufacturing environment.

The following potential contaminants have been identified on the BLM property only:

17. Asbestos

Permissible Exposure Limit - 0.01 mg/M3

Asbestos is considered carcinogenic to humans by IARC. Asbestos is an eye irritant. A symptom of inhalation is shortness of breath causing dizziness.

18. Chlorodiphenyl (PCBs)

Permissible Exposure Limit - 0.50 mg/M3

Chlorodiphenyl is considered carcinogenic to humans by the IARC. Entrance to the body is almost entirely through inhalation and absorption. Symptoms of exposure are irritation to the eyes and liver damage.

b. **Biological Hazards**

Examples of biological hazards that have been identified are:

1. Hazards associated with work on or near sewage lines.
2. Parasitic insects that are carriers of disease, like the wood tick.
3. Poisonous snakes.
4. Spiders, Bees, and Wasps can be a hazard, particularly for those people who suffer allergic reactions to the venom.

c. **Radiological Hazards**

Radioactive materials in the uranium ore have been identified as a potential exposure hazard during MRAP operations.

1. Thorium-230      Derived Air Concentration -  $3.0 \times 10^{-12}$   $\mu\text{Ci/ml}$
2. Uranium-238      Derived Air Concentration -  $2.0 \times 10^{-11}$   $\mu\text{Ci/ml}$

3. Radium-226      Derived Air Concentration -  $3.0 \times 10^{-10}$   $\mu\text{Ci/ml}$

## 5.2 HEAT STRESS

### a. **Temperature Concern**

Heat stress will be of concern during periods of warmer ambient temperature.

### b. **Factors**

The level of PPE required for the task along with the following factors affect individuals' susceptibility to heat stress:

1. Level of physical fitness
2. Acclimatization to environment
3. Age
4. Dehydration and/or diarrhea
5. Obesity
6. Alcohol or drug use
7. Infection
8. Sunburn

### c. **Prevention Methods**

1. The criteria established as the Threshold Limit Values (TLV) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) for heat stress, will be followed to provide adequate cooling down of workers.
2. One or more of the following control measures can be used to help control heat stress:
  - a) Establishment of a work/rest regimen that will provide adequate rest periods for cooling down. This may require additional shifts for workers or earlier/later work schedules.

- b) All breaks are to be taken in a shaded rest area.
- c) Adequate liquids will be provided to replace lost body fluids to ensure that the cardiovascular system functions properly. The thirst mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost sweat. Water intake should correspond to current environmental conditions and level of PPE.
- d) Replacement fluids can be fresh water or an electrolyte solution, such as Gatorade or Quick Kick, or a combination of these. Salt tablets will not be used.
- e) Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments provided the employee is properly trained to its use.
- f) Employees shall remove impermeable protective garments during rest periods. Disposition of these garments will be at the discretion of the OHST.
- g) Employees shall not be assigned other tasks during rest periods.
- h) All employees shall be informed of the signs and symptoms of heat stress along with the importance of adequate rest, acclimatization, and proper diet in its prevention.

d. **Signs and Symptoms**

- 1. **Heat rash** may result from continuous exposure to heat or humid air.
- 2. **Heat cramps** are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:
  - a) Muscle spasms
  - b) Pain in the hands, feet, and abdomen
- 3. **Heat exhaustion** occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
  - a) Pale, cool, moist skin
  - b) Heavy sweating

- c) Dizziness
- d) Nausea
- e) Fainting

4. **Heat stroke** is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur.

Competent medical help must be obtained immediately. Signs and symptoms are:

- a) Red, hot, usually dry skin
- b) Lack of or reduced perspiration
- c) Nausea
- d) Dizziness and confusion
- e) Strong, rapid pulse
- f) Coma

**e. First Aid**

1. The American Red Cross Standard First Aid Workbook shall be maintained as a reference for Standard Operating Procedures. This reference shall be maintained with the site copies of the MRAP HSP and all other required reference material.

**5.3 HYPOTHERMIA**

**a. Temperature Concerns**

Hypothermia will be of concern depending upon ambient temperature.

**b. Factors**

The following heat loss pathways are factors that can contribute to the amount of injury sustained in the cold environment:

1. **Radiation** - up to 25% of the heat loss sustained in a cold environment can be attributed to radiation from exposed flesh.
2. **Conduction** - bare skin contact with cold objects: ladders, metal surfaces, wet clothing, snow, ice, or water all result in a rapid loss of heat in the localized effected area.



3. Convection - best described by the "WIND CHILL INDEX", the movement of air can be the greatest and most deceptive factor of worker body heat loss.
4. Evaporation - the body's natural cooling mechanism presents a compounding effect on a conductive environment.

**c. Prevention Methods**

1. The criteria established as the TLV, recommended by the ACGIH for cold stress, will be followed to maintain workers, deep body core temperature.
  - a) The work/warm-up schedule recommended by the ACGIH will be used to provide adequate periods for re-warming.
  - b) Provisions for additional full body protection is required if work is performed in temperatures at or below 4°C.
  - c) Warning to the workers and special protection (mittens) for the hands may be required to prevent contact frostbite during periods that cold surface temperatures fall below -7°C.
  - d) For exposed skin, continuous exposure should not be permitted for an equivalent chill temperature of -32°C.

**d. Signs and Symptoms**

1. Unless there are unusual or extenuating circumstances cold injury to other than hands, feet, and head is not likely to occur without the initial signs of hypothermia. Utilize Table 5-2 as a guide to evaluating worker hypothermia symptoms.

**e. First Aid**

1. The American Red Cross Standard First Aid Workbook shall be maintained as a reference for Standard Operating Procedures. This reference shall be maintained with the site copies of the MRAP HSP and all other required reference material.

Table 5-2

**Progressive Clinical Presentation of Hypothermia**Core Temp.

°C	°F	Clinical Signs
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37	98.6	"Normal" oral temperature.
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36	96.8	Metabolic rate increases attempting to compensate for heat loss. Transport to a medical facility for treatment.
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**5.4 NOISE**

- a. Geotech will follow the guidelines specified in 29 CFR 1910.95 for the Hearing Conservation Program.
  1. Excessive noise levels may be generated from drilling rigs, air compressors, electrical generators, and heavy construction equipment.
  2. Hearing protection will be worn by all employees working in noise levels of 85dBA or greater.
  3. The requirements of Geotech Manual 103, "Health and Safety Manual", ES&H Procedure 8.5 shall be followed.

**5.5 OTHER PHYSICAL**

- a. Each of the following physical hazards have been identified as potential safety hazards at MRAP. Requirements to control these hazards are addressed in detail in individual Geotech Manual, 103, "Health and Safety Manual," ES&H Procedures.
  1. ES&H Procedure 2.4 & 2.11 address underground utilities, buried tanks, and natural gas/hazardous substance pipelines.
  2. ES&H Procedure 2.11 addresses work around overhead power lines, and energized electrical systems.

3. ES&H Procedure 2.9 addresses work around heavy equipment (e.g., backhoes, drill rigs, etc.).

## **SECTION 6 - PERSONAL PROTECTIVE EQUIPMENT**

### **6.1 INTRODUCTION**

- a. The following discussions relate to programmatic requirements for Personal Protection Equipment (PPE). Requirements shall be established based on specific tasks. These requirements will be addressed in site-specific HSPs:
  1. Guidance for the ensemble content listed is taken from References 1 and 3, Appendix C.
  2. Protection Factors for the use of the respiratory protection equipment used in these ensembles is based on References 2 and 4, Appendix C.
  3. Evaluation for changing the PPE level specification is required throughout the work.
  4. Personnel monitoring must be performed during the initial performance period of each specific task type. This will ensure that the level of protection selected is appropriate for the worker breathing zone concentrations and dermal exposure levels measured.

### **6.2 PROTECTIVE EQUIPMENT ENSEMBLES**

- a. Level B required protection consists of the following ensemble:
  1. Full face supplied air respirator approved by the Mine Safety and Health Administration (MSHA) or National Institute for Occupational Safety and Health (NIOSH). Respirators can be:
    - a) Pressure demand, self-contained breathing apparatus.
    - b) Pressure demand, air line respirator.
  2. Chemical-resistant clothing (coveralls and long sleeved, hooded jacket; one or two piece chemical splash suit; disposable chemical-resistant, one-piece suit).
  3. Long cotton underwear
  4. Gloves (outer), chemical-resistant.

5. Gloves (inner), chemical-resistant.
  6. Boots (outer), chemical-resistant, steel toe and shank.
  7. Boots covers (outer), chemical-resistant (disposable).
  8. Hard Hat (face shield).
- b. Level C required protection consists of the following ensemble:
1. Air-purifying respirator, full-face, canister equipped (MSHA or NIOSH approved).
  2. Chemical-resistant clothing (coveralls; hooded, one or two piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls).
  3. Coveralls.
  4. Long cotton underwear.
  5. Gloves (outer), chemical-resistant.
  6. Gloves (inner), chemical-resistant.
  7. Boots (outer), chemical-resistant, steel toe and shank.
  8. Boots covers (outer), chemical-resistant (disposable).
  9. Hard Hat (face shield).
- c. Modified Level D required protection consists of the following ensemble:
1. Chemical-resistant clothing (coveralls; hooded, one or two piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls).
  2. Coveralls.
  3. Long cotton underwear.
  4. Gloves (outer), chemical-resistant.

5. Gloves (inner), chemical-resistant.
  6. Boots (outer), chemical-resistant, steel toe and shank.
  7. Boots covers (outer), chemical-resistant (disposable).
  8. Hard Hat (face shield).
- d. Level D required protection consists of the following ensemble:
1. Coveralls, or sturdy work pants and sleeved shirt.
  2. Gloves, when applicable.
  3. Boots (outer), leather or chemical-resistant, steel toe and shank.
  4. Safety glasses or chemical splash goggles when applicable.
  5. Hard Hat (face shield) when applicable.

### **6.3 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS**

**a. Site Hazards**

1. Refer to Section 5 of this document for Site Hazards.
2. MRAP project is scheduled until October 1997.

**b. PPE Selection and Use**

1. PPE shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterizations and analysis.
2. PPE selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and durations, and the hazards and the potential hazards identified at the site.
3. Positive pressure self-contained breathing apparatus, or positive pressure air line respirators equipped with an escape air supply shall be used in IDLH conditions.

4. The level of protection provided by PPE selection shall be increased when additional information or site conditions show that increased protection is necessary to reduce employee exposures below established permissible exposure limits for hazardous substances and health hazards.
5. The level of protection provided may be decreased when additional information or site conditions show that decreased protection will not result in hazardous exposures to employees.
6. The level of protection deemed necessary by the OHS Technician will correlate with those ensembles set forth in Section 6.2 of this procedure.

**c. Maintenance and Storage**

1. All unissued PPE will be controlled by OHS Technicians and stored in an appropriate manner at a location to be determined.

**d. PPE Decontamination**

1. PPE decontamination will not occur routinely in favor of proper disposal of disposable coveralls (e.g., Tyvex, etc.).

**e. Training and Proper Fit**

1. Prior to PPE issue other than hard hats, boots, and safety glasses, all Geotech employees and subcontractors will be subjected to a training session addressing major points and concerns.
2. This training will be given by OHS Technicians or their designees and properly documented on a Geotech Training Form (GJPO 1720).
3. OHS Technicians will ensure all PPE issued is of the proper size and fit for the employee to ensure maximum efficiency.

**f. Donning and Doffing Procedures**

1. When PPE, other than hard hats, boots, and safety glasses, is required, donning and doffing procedures will be provided by the OHST. The on-site OHS Technicians will be responsible for ensuring all employees adhere to these posted procedures.

**g. Inspection**

1. PPE will be inspected immediately prior to use to verify integrity of all surfaces and seams.
2. PPE in storage will be routinely inspected to ensure quality at an interval to be determined by OHS Technicians based on storage and surrounding conditions.

**h. In-Use Monitoring**

1. During PPE use, OHS Technicians will monitor for rips, tears, etc. in the PPE at intervals as he/she deems necessary based on site activities.
2. Any discovery of a breach in the integrity of PPE shall be corrected as soon as possible and the event documented on a Health and Safety Checklist Form.

**i. Program Effectiveness**

1. Evaluation of PPE effectiveness shall be performed by a staff Industrial Hygienist when requested by the OHS supervisor.

**j. Temperature Extremes (see Section 7 of this document)**

**6.4 GUIDELINES FOR RESPIRATOR USE**

- a. Respirator use will be in accordance with the Geotech Respirator Program.
- b. Respiratory protection will be required in areas where the potential for breathing zone contaminants exists until accurate breathing zone exposure data is established.
- c. During initial work in areas suspected to be contaminated with suspected or known carcinogens the lowest level of respiratory protection required within the Exclusion Zone and Decontamination Corridor will be Level C.
- d. The following standard procedures need to be understood by all on-site personnel:
  1. The respiratory protection utilized on site will be in compliance with OSHA, R1910.134 and the Geotech Manual 103, "Health and Safety Manual," ES&H Chapter 5.
  2. Only properly cleaned, maintained, NIOSH/MSHA-approved respirators shall be used on site.



3. When air-purifying cartridges are specified for use, they shall be replaced when loadup or breakthrough occurs, or at least at the end of each shift.
4. Only employees who have training, medical verification, pre-issue fit tests, and annual fit tests thereafter, will be allowed to work in atmospheres where respirators are required. Fit test documentation will be kept as part of each employee's training documentation records.
5. If an employee has demonstrated difficulty in breathing during the fit testing or during use, he or she shall not be allowed to wear a respirator until a medical examination can be conducted to re-verify medical acceptability.
6. No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee or other employees will be impaired by use of a respirator.
7. Regular eyeglasses and contact lenses are not to be worn while wearing a respirator. Only approved respirator eyeglasses will be allowed.
8. Air-supplied respirators shall be assembled according to manufacturer's specifications regarding hose length, couplings, valves, regulators, manifolds, etc. and use certified grade D or better air.
9. All personnel wearing respirators will be required to be clean shaven prior to each day's shift.

#### 6.5 GUIDELINES FOR HEARING PROTECTION USE

- a. Hearing protection will be worn by all employees working in noise levels of 85dBA 8 hour TWA or greater.
- b. Selection of hearing protection devices should provide a sufficient noise reduction ratio to lower worker exposure to below 85dBA.
- c. All employees wearing hearing protection will be trained on its use and limitations.
- d. Engineering or administrative controls will be considered to preclude the need for wearing hearing protection.

## SECTION 7 - MONITORING

### 7.1 AREA MONITORING

- a. Monitoring for airborne radioparticulates, silica, and heavy metals will be conducted using an MSA Flowlite pump and filter assemblies appropriate for the sampling being performed. Area monitoring for explosive limits, oxygen, and volatile organic compounds will be conducted with "real time" direct-reading instruments and charcoal tubes.
- b. The methods of maintenance and calibration for the sampling equipment used is located in the Geotech ES&H Desk Top Procedure which will be kept by the OHST with other Geotech reference materials.

### 7.2 PERSONNEL EXPOSURE MONITORING

#### a. Introduction

1. Personnel exposure monitoring will be conducted during activities in all contaminated areas until sufficient data has been collected to characterize the worker breathing zone exposure.
2. Monitoring shall be further conducted when, in the judgment of the OHST, an activity or the climate will change the results of the previous characterization work completed.
3. All personnel exposure monitoring records will be maintained for a minimum period of 30 years after termination of employees.

#### b. Tracking Representative Exposure Monitoring Results

1. Documentation of exposure during "representative" exposure monitoring of Geotech and subcontractor employee exposure will be performed on Geotech Form 1733, "Hazardous Materials Access Log".

#### c. Radiological Monitoring

1. The monitoring of personnel for radiological contamination will be performed at the access/frisking station of the controlled area. All personnel will be

required to frisk themselves for contamination prior to exiting the controlled area.

2. Equipment surveys will be conducted prior to the equipment leaving the controlled area, and will be documented on Geotech Form 1553. All equipment will be decontaminated to as low as reasonably achievable levels (ALARA). Only a OHST technician can release equipment from a controlled area.
3. At least 20% of the work force will be monitored for airborne contamination using lapel samplers. Those employees likely to have the highest potential exposure to those hazardous substances and health hazards most likely to be present above established permissible exposure limits will be those chosen for monitoring.
  - a) When sufficient data is gathered to allow estimation of exposure levels for frequently performed tasks, sampling will be reduced to monitoring 10% of the work force. Those employees likely to have the highest potential exposure to those hazardous substances and health hazards most likely to be present above established permissible exposure limits will be those chosen for monitoring.
4. The methods of maintenance and calibration for the sampling equipment used is located in the Geotech ES&H Desk Top Procedures kept by the OHST.
5. Bioassay samples will be collected for determining internal intake of radionuclides, if deemed necessary according to the Geotech Internal Dosimetry Program. The bioassay program components are contained in Appendix A.
6. Personnel radiation exposure will be monitored through the use of assigned thermoluminescent dosimeters (TLDs). Upon exiting the access/frisking station at the end of the scheduled work day, all TLDs will be surrendered and stored overnight in a designated wooden box containing the controlled TLDs.

d. **Monitoring for Heat Stress**

1. **Permeable PPE In Use**
  - a) The heat stress of workers on site will be monitored by the Wet Bulb Globe Temperature Index (WBGT) technique if ambient temperatures reach 70°F. This method will require area monitoring using a heat stress

monitoring device, such as the WBGT Heat Stress Monitor (Reuter Stokes).

- b) The WBGT will be compared to the TLVs recommended by the ACGIH. A work/rest regimen will then be established in accordance with ACGIH/NIOSH guidelines. This regimen and the base guideline will be available on site through the OHST.
- c) The methods of maintenance and calibration for the WBGT used is located in the Geotech OH&S Desktop Procedure Manual kept by the OHST.

## **2. Non-Permeable PPE In Use**

- a) For workers wearing non-permeable PPE, the ACGIH TLVs can not be used. During these situations monitoring will begin when ambient temperature in the work area exceeds 70°F.
- b) Frequency of monitoring depends on air temperature adjusted for solar radiation and the level of work load outlined on Table 7-1.
- c) Heart Rate. Count the radial pulse during a 30-second period as early as possible in the rest period.
  - i) If the heart rate exceeds 110 beats/min. at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
  - ii) If the heart rate still exceeds 110 beats/min. at the next rest period, obtain medical attention.
- d) Oral temperature. Using a clinical thermometer (3 minutes under the tongue) or a similar device to measure the oral temperature at the end of the work period (before drinking).
  - i) If oral temperature exceeds 99.6°F(37.6°C), shorten the next work cycle by one-third without changing the rest period.
  - ii) If the oral temperature exceeds 99.6°F(37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.

**CAUTION:** DO NOT permit a worker to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6°F.

- e) Body Water Loss can be used to determine proper intake of fluids and may be a consideration.

**TABLE 7-1**

**Suggested Frequency of Physiological Monitoring  
for Fit and Acclimatized Workers<sup>a</sup>**

ADJUSTED TEMPERATURE <sup>b</sup>	NORMAL WORK ENSEMBLE <sup>c</sup>	IMPERMEABLE WORK ENSEMBLE
90°F or Above	After each 45 mins of work	After each 15 mins of work
87.5° - 90°F	After each 60 mins of work	After each 30 mins of work
82.5° - 87.5°F	After each 90 mins of work	After each 60 mins of work
77.5° - 82.5°F	After each 120 mins of work	After each 90 mins of work
72.5° - 77.5°F	After each 150 mins of work	After each 120 mins of work

<sup>a</sup> For work levels of 250 kilocalories/hour

<sup>b</sup> Calculate the adjusted air temperature (ta adj) by using this following equation and guidelines:  $ta\ adj\ ^\circ F = ta\ ^\circ F + (13 \times \% \text{ SUNSHINE})$ . Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate the % SUNSHINE by judging the percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100% SUNSHINE = no cloud cover and a sharp, distinct shadow; 0% SUNSHINE = no shadows)

<sup>c</sup> Normal work ensemble consists of cotton overalls or other cotton clothing with long sleeves and pants.

#### e. Monitoring and Control Program for Cold Stress

1. The control program to be used for MRAP will include:
  - a) Medical supervision of the workers performed during the pre-placement or "at-risk" physical examination.

- b) Employee orientation and training on cold stress, cold-induced illness and their symptoms, water and salt replacement, proper clothing, and emergency first aid procedures.
- c) Work/rest regimes with heated rest areas and enforced rest breaks.
- d) Scheduled drink breaks for recommended fluids.
- e) Environmental monitoring using the air temperature and wind speed indices to determine wind chill and adjustment of work/rest schedules accordingly when ambient temperatures fall below 20°F.
- f) Reduction of cold stress through the proper use of personal protective equipment, administrative controls, and engineering controls when available.

**f. Monitoring Noise Sources**

- 1. Geotech Manual 103, "Environmental, Safety, and Health Procedures" Section 8.5, provides guidance for administration of a hearing conservation program to prevent occupational hearing loss.
- 2. The requirements of ES&H Procedure 8.5 will be followed during all phases of MRAP work.
- 3. Hearing protection will be worn by all employees working in noise levels of 85dBA 8 hour TWA or greater.

## SECTION 8 - STANDARD OPERATING PROCEDURES

### 8.1 USE OF GEOTECH MANUAL 103 and ES&H DESKTOP PROCEDURE

- a. Geotech Manual 103, "Health and Safety Manual," and ES&H Desktop Procedures will be used as the source document for all of the Standard Operation Procedures during work at Monticello Remedial Action Project. These references will be in the custody of the SHSC at the millsite.

### 8.2 ENGINEERING CONTROLS AND WORK PRACTICES

- a. Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits of substances regulated by OSHA 29 CFR 1910.120 except to the extent that such controls and practices are not feasible.
- b. Engineering control shall include wetting down for dust control. Other engineering controls which may be feasible are the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material-handling equipment. Work practices which may be feasible are removing all nonessential employees from potential exposure during opening of drums, wetting down dusty operations and locating employees upwind of possible hazards.
- c. Whenever engineering controls and work practices are not feasible, PPE shall be used to reduce and maintain exposures to or below the permissible exposure limits of substances regulated by OSHA 29 CFR 1910.120.
- d. The employees shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits.
- e. An appropriate combination of engineering controls, work practices and personal protective equipment shall be established to reduce and maintain employee exposure to or below the established permissible exposure limit for hazardous substances and health hazards not regulated by OSHA 29 CFR 1910.120.

### **8.3 SANITATION**

Geotech shall follow the regulatory requirements of 29 CFR 1910.120 and 29 CFR 1910.141; *Subpart J - General Environment Controls, Sanitation* (Reference 20) requiring sanitary facilities that meet the following minimum standards.

#### **a. Potable Water**

1. The Project Manager shall ensure that the following requirements are adhered to regarding the supply of potable water at the project site in order to meet State drinking water requirements.
  - a) The amount of potable water is adequate for the number of workers at the site.
  - b) Water containers used to store potable water are equipped with a cap capable of tight closure.
  - c) Water dispensers are equipped with a tap to dispense the water. (Water shall not be dipped from the container.)
  - d) All containers used to dispense drinking water are clearly marked for exclusive use as a potable water container.
  - e) When single-serve disposable cups are supplied, a sanitary container for the unused cups, and a receptacle for the used cups shall be provided.

#### **b. Non-Potable Water**

1. The Project Manager shall ensure that outlets for non-potable water (fire man, dust suppression) shall be clearly marked to show that the water is not safe for drinking, washing or cooking. Cross-connection between non-potable and potable water systems is prohibited.



**c. Toilet Facilities**

1. The Project Manager shall ensure that toilet facilities are provided in the SUPPORT ZONE as listed below.

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<u>Number of Employees</u>	<u>Minimum Number of Facilities</u>
20 or fewer	One
More than 20, fewer than 200	One toilet seat, and one urinal per 40 employees
More than 200	One toilet seat, and one urinal per 50 employees

---

2. Under temporary field conditions, the subcontractor shall make provisions to ensure that at least one toilet facility is available for use by the employees. (Either supplied by the subcontractor or a public facility in the vicinity.)
3. Project site not provided with a sanitary sewer shall be provided with one of the following toilet facilities (unless prohibited by local codes):
  - a) Chemical toilets
  - b) Recirculation toilets
  - c) Combustion toilets
  - d) Flush toilets

**d. Hand Washing Facilities**

1. The Project Manager shall ensure that adequate washing facilities using a potable water source are provided for employees working at a project site where hazardous substances may be harmful to employees. Washing facilities shall be:
  - a) At the Access Control Point to the SUPPORT ZONE, if established, where worker exposures to the hazardous materials are below the "Permissible" or "Published" exposure levels.

- b) In the immediate vicinity of the project site toilet facility.
- c) Equipped to enable employees to remove hazardous substances from themselves.

**e. Shower Facilities**

1. The Project Manager shall ensure that showers and change rooms are provided at the project site when the duration of cleanup of hazardous substance removal will require six months or more to complete.
2. Showers and change rooms shall be provided for employees required to wear protective clothing. The showers and change rooms will minimize the possibility of contamination from hazardous materials or exposure to health hazards associated with the project site.
3. The Project Manager shall ensure that the showers and change rooms facilities provided meet these minimum specifications when hazardous waste operations commence.
  - a) One shower is provided for each 10 employees of each sex, who are required to shower during the same shift.
  - b) body soap or other appropriate cleaning agents convenient to a shower are provided.
  - c) Showers shall have hot and cold water supplied to a common discharge line.
  - d) Employees who use the shower are supplied with clean towels.
  - e) The change rooms shall contain the shower facilities required for the project sit, separating two change areas.
    - i) One change area having an exit leading off the project site. This area shall provide a clean area where employees can remove,k store, and put on street clothes.
    - ii) The second change area having an exit to the project sit. This area shall provide a controlled area where employees can remove, store, and put on work clothes and personal protective clothing.

**e. Break/Eating Areas**

1. Break and eating areas will be at the discretion of the subcontractor with concurrence of the OHST.

## **SECTION 9 - SITE CONTROL**

### **9.1 ESTABLISHMENT OF WORK ZONES**

#### **a. Definitions**

- 1 **EXCLUSION ZONE** - Work area where hazardous substances are present as defined by 29 CFR 1910.120. Access is on a "need to" basis only and requires full compliance with all training specifications. Exclusion Zone boundary is determined by the site OHS technician in conjunction with the Field Engineer or Construction Inspector.
2. **HOT LINE** - The boundary around the Exclusion Zone.
3. **CONTAMINATION REDUCTION ZONE** - Area where workers should not be exposed to hazardous conditions. All decontamination of personnel and equipment will be performed in this area. Access will be controlled and restricted area will be designated by the on site OHS technician in conjunction with the Field Engineer/CI.
4. **CONTROLLED AREA** - Any area for which access is managed to protect individuals from exposure to radiation or radioactive materials is classified as a controlled area. The defining criteria for a controlled area is established in the Geotech Environmental, Safety and Health Procedure, Manual 103, Section 3.3.
5. **SUPPORT ZONE** - The uncontaminated area where workers should not be exposed to hazardous conditions.

#### **b. Placement of boundaries**

1. Boundary areas will be made of construction security fencing, snow fencing, or barrier ribbon depending upon the terrain, time frame of work, and ease of accessibility to the area. It will be erected by the subcontractor with CI and OHST concurrence.
2. Access point will be established by the OH&S Technician to monitor the flow of personnel and equipment into and out of the work area.

## 9.2 POSTING

- a. Exclusion Zones will be marked by signs stating, "EXCLUSION ZONE."
- b. The boundary at a Controlled Area or Contamination Reduction Zone will be marked with signs stating, "CONTROLLED AREA" or "AUTHORIZED PERSONNEL ONLY, NO EATING, DRINKING, SMOKING, OR CHEWING."
- c. The Decontamination Stations and Access Control Points will be posted with signs designating them as such.
- d. The Support Zone outer boundary shall be posted "NO TRESPASSING."

## 9.3 SITE SECURITY

- a. Physical barriers will be erected as necessary to:
  1. Prevent the exposure of unauthorized, unprotected people to the hazards on the site.
  2. Avoid an increase in hazards from vandals or other persons seeking to dispose of additional waste on the site.
  3. Prevent the theft of government property.
  4. Avoid interference with safe working procedures.

## 9.4 VISITORS

- a. The term "Visitor" as used in this section cannot be applied to any Geotech employee. Examples of a visitor are Geotech clients, Federal/State Regulatory Officials, Chem-Nuclear Environmental Services or Chem-Waste Management corporate employees.
- b. All untrained visitors shall receive the visitor-applicable sections of the site specific training. The completion of this training does not allow the visitor into the controlled areas of the site. This training does provide an understanding of the hazards and control measures at the site and does not allow the untrained visitor access into the restricted areas at the site. This training will prevent the visitor from violating any controls unknowingly.

- c. The following sections of the project site-specific training may be omitted from the visitor briefing:
  - 1. Proper Use of PPE.
  - 2. Medical Surveillance Requirements.
  - 3. Requirements for confined space entry.
- d. Visitors requiring access to controlled areas shall complete GJPO Form 1772, "Visitor Dosimetry Issue Form" prior to receipt of dosimetry devices. This dosimetry shall be worn by the visitor at all times while in the radiologically controlled areas.
- e. The Project Manager or designated alternate shall approve all "trained" visitor access in the restricted areas. Visitors' entry requirements beyond the restricted areas are:
  - 1. Provide documentation of proper training.
  - 2. Complete medical surveillance requirements of this MRAP Program HSP and provide the information requested on Geotech Form-1763 if entering a Contamination Reduction Zone or Exclusion Zone.
  - 3. Comply with all the requirements of this MRAP Programmatic HSP and any site-specific HSP.

## **SECTION 10 - DECONTAMINATION**

### **10.1 INTRODUCTION**

- a. Decontamination station procedures will be posted to allow personnel exiting the Exclusion Zone to read through the Step-by-Step requirements.
- b. Compliance with the posted decontamination procedures will provide the final protective measures necessary to prevent worker exposure to the hazards present on the site.
- c. The procedures contained in this HSP are designed to allow the greatest amount of flexibility in set-up possible. They do not allow deviation from the flow pattern. Failure to complete all steps in sequence may result in off-site release of contamination.

### **10.2 DECONTAMINATION GUIDELINES**

- a. Decontamination of personnel for radiological contaminants will be accomplished by following the Geotech Manual 103 (Environmental, Safety, and Health Procedures Manual) Section 3.17. Controlled copies of this manual are maintained in the custody of the OHST at the millsite.
- b. Geotech supplied personal protective equipment other than hard hats, safety glasses, and safety shoes worn on site will not be worn off site. All site personnel shall utilize the step-off decontamination sequence whenever they leave the site.
- c. If site conditions require that the level of protection be changed, the decontamination procedure will be modified by the OHST.
- d. The decontamination station at any of the sites will include suitable receptacles for the disposal of used protective clothing.
  1. Polyethylene bags may be used for this purpose provided they are sealed daily.
  2. Contaminated protective clothing will not be removed from the decontamination area until it has been properly bagged.
- e. Adequate facilities for washing hands will be available at the decontamination station.

1. Hands will be washed prior to eating or drinking and before leaving the site at the end of each shift.
2. Personnel should shower at the first opportunity after completion of daily site activity.

### 10.3 EQUIPMENT DECONTAMINATION

- a. Before leaving the site, potentially contaminated equipment will be decontaminated by the operator of the equipment. Verification that equipment leaving the site has been adequately decontaminated is the responsibility of the OHST.



## SECTION 11 - EMERGENCY PROCEDURES

### 11.1 PURPOSE OF EMERGENCY PROCEDURES

- a. The purpose of the emergency procedures is to minimize the impact of any emergency or unusual occurrence upon the health and safety of personnel performing activities. These procedures also provide the preparedness and identify the manpower and equipment resources available to cope with industrial, radiological, and natural emergencies. Specific responses to accidents, injuries or natural emergencies are contained in the appendices to this section. Each is marked with a tab to provide for easy identification.

### 11.2 KEY PERSONNEL

- a. The key personnel at the work location are those with authority and training to respond to accidents and unusual conditions.
  1. The Program Manager is a Geotech employee, as are all the key personnel positions that are identified in the MRAP Program HSP. A listing of the current people performing as these positions will be identified in the site-specific HSPs.
- b. The names and telephone numbers of the Geotech CI and SHSC shall be posted conspicuously on the site. The phone numbers of the local responders is also required. The other numbers are:

San Juan Hospital	(801)587-2116
Monticello Police	(801)587-2273
Monticello Ambulance	(801)587-2237
St. Mary's Air Life (Grand Junction, CO)	(303)344-2550
Monticello Fire Dept.	(801)587-2500
Geotech Monticello Office	(801)587-2153
Geotech Grand Junction	(303)248-6000
Sheriff's Dispatcher	(801)587-2237

- c. Geotech Key Personnel - The key personnel will respond to emergencies according to the specific procedures found in this plan and the appendices to this section.

- d. Local Emergency Responders - The local emergency responders include the fire department, ambulance personnel, police and sheriffs departments. These persons will operate according to their charter and authority. In many cases, they are empowered, by law, to take control at the scene and direct actions.

### 11.3 EQUIPMENT

- a. In an emergency, equipment will be necessary to communicate with local responders, rescue and treat victims, to protect response personnel, and to mitigate hazardous conditions on site.
  - 1. Communications - Communications on the various sites include the telephone, portable radios, and voice communication.
    - a) Telephone - Telephone service is not usually provided on site and under normal circumstances personnel must leave the site and go to a public phone. However, Geotech will ensure that phone service is established at the millsite prior to initiation of significant construction activities. Geotech also maintains a telephone at its local office in Monticello. The telephone number in the Geotech Monticello office is (801)587-2153. The 24 hour per day telephone at the Grand Junction Projects Office is (303)248-6000.
    - b) Portable Radios - The CI, OHST, and selected other Geotech personnel have radios that may be used to communicate emergency information. These radios are most likely to be used to make the initial notification to the CI, who will notify the local emergency responders if telephone service is not available at the accident scene.
  - 2. Personal Protective Equipment - To meet the needs of any credible accident, PPE must be kept in reserve and maintained for emergency use. This equipment may be from the same stock that is used for daily operations provided a portion is reserved for emergency use and the stocks not depleted. The next level of protection from that used for routine operations must be available. For example, if Level C is the maximum routine level of protection used, then Level B protective equipment must be on hand for emergency use. This may include maintaining SCBA units on a site using only filter respirators.
  - 3. Other Equipment - Each site considered to contain hazardous substances must also maintain first aid and decontamination equipment necessary to treat injured persons. The minimum equipment on hand must include:

- a) First-aid kits (each subcontractor and OHST vehicle).
  - b) Fire extinguisher and blanket (each subcontractor and OHST vehicle).
  - c) 5 gallons of potable water, in portable containers (each subcontractor).
  - d) Containers to hold contaminated materials. (if applicable)
  - e) Air horn for emergency alarm.
4. The OHST is responsible for the correct placement of the emergency equipment on the site.

#### 11.4 RESCUE TEAM

- a. A rescue team will be required when work is performed in areas that are immediately dangerous to life or health (IDLH). The rescue team will standby near the restricted area boundary ready to rescue any workers whose health and safety is endangered. This will require the rescue team to be fully dressed for the conditions in the Exclusion Zone.

#### 11.5 ALARMS

- a. **Evacuations** - Evacuations will be signaled by two 5 second blasts of an air horn every 30 seconds, and will continue for 3 minutes or until all persons are clear of the area.
- b. **Take Cover** - The alarm for persons to take the nearest cover is 3 successive blasts of an air horn, 1 second each, about one second apart. The series of blasts will continue at 20 second intervals for 3 minutes.
- c. **All Clear** - The signal for all clear is one 5 second blast on an air horn.

#### 11.6 REFUGE/TOPOGRAPHY

- a. Site topography, layout and prevailing weather conditions will be discussed by the OHST and Field Engineer in relation to emergency response.
- b. Safe distances and a place of refuge will be determined on site by the OHST and Field Engineer - This information will be promulgated to all site employees during pre-work training will be provided in the site-specific HSP.

### **11.7 NOTIFICATION AND REPORTING OF OFF-NORMAL EVENTS**

- a. Notification of Events - The CI will notify Geotech in Grand Junction immediately after the discovery of an accident, injury or off-normal event. Requirements for this notification are contained in Geotech Manual-103 "Environmental, Safety, and Health Procedures" Chapter 7. Personnel at GJPO will make notification to outside agencies according to Chapter 7. Controlled copies of this manual are maintained in the custody of the OHST.
- b. Reporting of Events - The Project Manager or Senior Construction Management employee present will report accidents, injury or off-normal events in accordance with the reporting requirements contained in Geotech Manual-103 "Environmental, Safety, and Health Procedures" Chapter 7.

### **11.8 EMERGENCY RESPONSE PROCEDURES EXERCISE**

- a. Emergency Response Procedures shall be exercised at an interval deemed appropriate by the SHSC and the CI, however, one exercise shall be conducted annually prior to three (3) months after the beginning of the construction season.
- b. A critique of the exercise shall be conducted by the CI, SHSC, and other participants. The results of the critique shall be used to improve the existing Emergency Response Procedures.

### **11.9 EMERGENCY DECISION TREE**

- a. Management personnel involved in responding and recovery of emergencies should use the following decision tree for guidance (Figure 11-1).

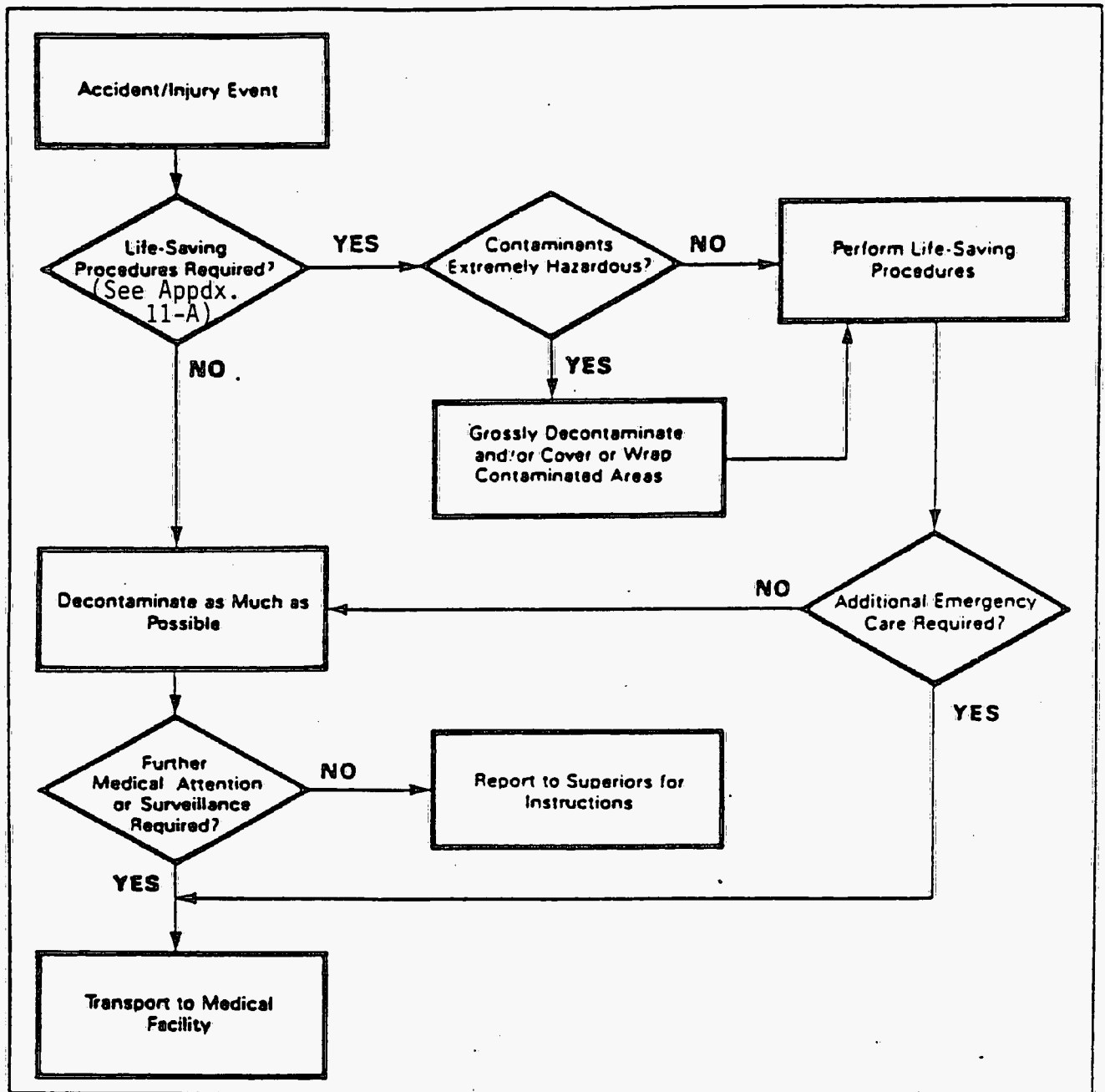


Figure 11-1. Decision Tree for Emergency Response Action

## **APPENDIX 11A - WORKER INJURY**

If an employee working in a contaminated area is physically injured, Red Cross First-Aid procedures will be followed in addition to the steps detailed below.

The types of injuries are varied. This procedure does not specify the method of treatment. This is the function of the first aid and CPR training. This action guide applies to:

- Fractures, Dislocations, Sprains and Strains
  - Cuts, Scrapes and Bites
  - Heat Illnesses
  - Heart attacks and strokes
  - Seizures
  - Diabetic Emergencies
  - Poisoning
  - Burns, including fire and chemical
1. **Call for medical assistance** - The ambulance number is 587-2237 or use the radio. Then when time permits, call the CI and OHST.
  2. **Life Saving Procedures Required (Immediate Danger)** - If the area is immediately dangerous to life or health (IDLH), then the victim should be moved if it is safe for assisting personnel. Examples include fire, lack of oxygen, serious traffic hazard, risk of explosion, collapsing material or electrical hazards. Move victims according to American Red Cross Standard First Aid Procedures. Persons trained and qualified in first aid should direct those not trained.
  3. **No Immediate Danger** - If the area presents no immediate danger, you should follow emergency action principles and care for the victim at the scene. Your task will be to prevent further injury to the victim. Moving the victim could make the injuries worse. If contamination does not present an immediate danger the victim should not be moved. An evaluation to move the victim will be made when emergency medical help arrives.
  4. **Treating and Decontamination** - When an injured person is contaminated, a decision will be required to give priority to the first aid actions or decontamination. The decision tree, Figure 11-1, should be used to help make this decision.

5. **Decontamination** - If decontamination is necessary, follow the procedures contained in this plan. If an injured person is transported to a medical facility contaminated, an OHST will go to the facility to assist and advise the medical personnel.
6. Notify the Geotech PM at GJPO.

## **APPENDIX 11B - CHEMICAL BURNS**

Burns occur when chemicals contact the eyes and/or skin of workers. If this occurs, perform the following:

### **THE FIRST TWO STEPS SHOULD BE PERFORMED QUICKLY**

1. **Call for medical assistance** - The ambulance number is 587-2237 or use the radio. Then when time permits, call the CI and OHST.
2. **Flush the Area** - Flush the area immediately with large amounts of water. Continue for 15 to 30 minutes. For chemicals in the eyes, lift the lower and upper lids and flush the eyes.
3. **Remove any affected clothing or jewelry.**
4. **Care for shock.**
5. **Consult the first aid manual on additional care.**
6. **Notify the Geotech PM at GJPO.**



## APPENDIX 11C - FIRE

1. **Localized Fire** - If a localized fire breaks out, the appropriate fire extinguisher will be used to bring the occurrence under control. If necessary and feasible, a fire blanket, soil, or other inert materials will be placed on the burning area to extinguish the flames and to minimize the potential for spreading. The Monticello Fire Department will be notified of any and all fires.
2. **Uncontrolled Fires** - If an uncontrolled fire develops or additional assistance is needed, call the Monticello Fire Department at 587-2500. A written Memorandum of Understanding (MOU) will be established between Geotech and the Monticello Fire Department.
  - a. Immediately evacuate the area and stand clear.
  - b. If the fire releases potentially toxic gases, all persons in the immediate vicinity must be evacuated. Use the air horn and sound the alarm.
  - c. Evacuate upwind to avoid chemical exposure to the designated assembly area. Supervisors are to account for all of their personnel.
  - d. Inform the fire department of the toxic gases, if applicable.
3. The CI must evaluate if additional personnel are required to support the response actions. If so, a call for assistance must be made to Geotech at Grand Junction. Qualified personnel will then be dispatched to assist in the response and recovery.
4. Notify the Geotech PM at GJPO.

## **APPENDIX 11D - NATURAL DISASTERS**

Natural disasters may occur at the properties due to weather. These include lightning, high winds and although unlikely, a tornado.

1. **Lightning** - Persons should not work in open areas, near trees or other equipment outside during lightning storms. Stop work until the storm passes. If possible, clear the site until the storm passes. If there is insufficient time, sound the "take cover" horn, which signifies for persons to enter buildings or automobiles.
2. **High Winds** - If high winds are forecast, including tornadoes, then the site should be cleared before the winds become hazardous. Workers should be instructed to go to an appropriate shelter. If a rise in winds is sudden, use the "take cover" or "evacuate" horn as appropriate.
3. If an evacuation is called, account for all persons before leaving the site. If a take cover is called, account for personnel after the all clear.
4. Notify the Geotech PM at GJPO of any work stoppage due to lightning and high winds.

## SECTION 12 - SAFETY

### 12.1 CONFINED SPACE ENTRY

- a. No confined space entries are planned within the scope of work.
- b. Geotech Manual 103, "Environmental, Safety, and Health Procedures" Chapter 2.7 provides Standard Operating Procedures for use in confined space entry.

### 12.2 EXCAVATION SAFETY

- a. All excavation activities shall be conducted in compliance with all applicable UOSHA regulations and Subpart P 29 CFR 1926 as follows:
- b. As a minimum, the following rules shall be strictly observed:
  1. Excavations exceeding 4 feet in depth into which employees may be required to descend shall be sloped, shored, or stepped in accordance with UOSHA regulations. All excavations over 20 feet deep shall be evaluated by a professional civil engineer.
  2. Excavation spoils shall not be placed within two feet of the edge of the excavation.
  3. All excavations exceeding 4 feet in depth will be inspected by a competent person daily, after every rainstorm, and after other hazard-increasing occurrences.
    - a) All structures adjacent to any excavation exceeding 5 feet will be examined by a competent person to ensure that no unsafe conditions exist.
  4. Trees, boulders, and other surface encumbrances located so as to create a hazard to employees involved in excavation or in the vicinity thereof, at any time during operations, will be removed or made safe before excavating is begun.
  5. At any time entry into an excavation is required, a standby person shall be available. Requirements for wearing a lifeline and harness in addition to the

protective clothing described in Section 6.0 of this HSP will be determined on a "case by case" basis to avoid creating an undue hazard.

6. For all excavations/trenches in excess of 4 feet deep appropriate access methods, such as ladders or ramps, will be used to enter the excavation. Under no circumstances will an employee be permitted to ride backhoe buckets or other similar equipment to enter or exit the excavation. These access locations will be spaced no farther than 25 feet travel distance.

### **12.3 FIRE SAFETY**

- a. As a fire prevention measure, no smoking or fires shall be permitted within any controlled or restricted areas, and wherever there may be dry grass, other flammable material.
- b. Vehicles and equipment will not be left idling or parked in or around areas where catalytic converters may cause grass fires.
- c. Hot work, such as welding or cutting, shall be performed only as absolutely necessary and requires a permit. Hot work shall only be conducted after a site inspection for fire hazards. At least two appropriate fire extinguisher shall be available during hot work procedures.
- d. Work areas with strong fences, such as a chain link fence, must have two exits that are unlocked while work is in progress. The exits may be locked if each person has a key.
- e. All flammable and/or combustible liquids brought on site shall be handled/stored in a manner consistent with all current UOSHA Regulations.

### **12.4 ELECTRICAL SAFETY**

- a. If temporary or permanent electrical power is provided, the NFPA 70 (National Fire Protection Association) will be adhered to. Also, all state and local codes will be followed. All wiring will be carried out by qualified electricians.
- b. Ground-fault interrupters and water-tight, corrosion-resistant connecting cables will be used to help minimize the hazard of electrical equipment used on site (i.e.; portable generators).
- c. Any capacitors which retain a charge will be properly grounded before handling.

## APPENDIX A - LIST OF REFERENCES

1. Geotech Management Policies Manual.
2. Geotech Manual 103, Health and Safety Manual.
3. Geotech Manual 104, Operations Management Policies Manual.
4. ES&H Desktop Procedures Manual.
5. 29 CFR 1910, General Industry Safety and Health Regulations.
6. 20 CFR 1926, Safety and Health Regulations for Construction.
7. UOSHA R 500-108-120, Hazardous Waste Operations and Emergency Response.
8. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities; Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1985.
9. NIOSH guide to Industrial Respiratory Protection; Department of Health and Human Services, Centers for Disease Control, National Institute for Occupational Safety and Health; Sep 1987.
3. Guidelines for the Selection of Chemical Resistant Clothing, 3rd Edition, Volume I - Appendix I, "Definition of Protection Levels"; NTIS Report No. AD A179-516.